

# **Nuclear Gauge Testing Manual**

## **Section 4**

# **Operating Instructions**

## **Testing - Soils**

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## OPERATING INSTRUCTION N201

TEST PARAMETERS (SOILS)  
TROXLER 3440**1 SET UP**

- Press 

ON
----

 and allow the nuclear gauge to complete the self-test routine.

**2 UNITS**

When **<READY>** is displayed:

- Press 

SHIFT x
------------

- Press 

SPECIAL
9

 and the following is displayed:

SPECIAL FUNCTION
YES – Next menu
1 - STAT TEST
2 - DRIFT TEST

- Press 

YES EXIT
-------------

 repeatedly until the following is displayed:

YES – Next menu
9 - SET UNITS
10 - BAND RATE
11 - COMM PROTOCOL

- Press 

SPECIAL
9

 and the following is displayed:

UNITS in XXX
Press 1 – PCF
2 – METRIC
ENTER – No change

- Press 

DEPTH
2

 and the following is displayed:

UNITS IN METRIC
-----------------

The display will return to **<READY>**.

### 3 COUNT TIME

► Press 

TIME
-

 and the following is displayed:

TIME: XX
1 – 15 sec
2 – 1 min
3 – 4 min

► Press 

DEPTH
2

 and the following is displayed:

-COUNT TIME-
1 min

The display will return to <READY>.

### 4 SOIL MODE

► Press 

SHIFT
x

► Press 

MODE
8

 and the following is displayed:

MODE: XXXX
Select: 1 – SOIL
2 – ASPHALT
(CE to exit)

► Press 

COUNTS
1

And the following will be displayed briefly:

SOIL MODE
-----------

The display will return to <READY>.

### 5 MAXIMUM DRY DENSITY

► Press 

PROCTOR/ MARSHALL
+

 and the following is displayed:

MA = XXXX kg/m3
PR = XXXX
VD = XXXX
Want to change?

To retain the value, go to 5.1.

To change the value, go to 5.2.

### 5.1 Retain the Value

► Press 

NO/CE
C/CE

 to retain the displayed value of PR.

The display will return to <READY>. Go to 6.

### 5.2 Change the Value

► Press 

YES
EXIT

 to change the displayed value of PR.

And the following will be displayed:

Select:
1 – MA
2 – PR
3 – Voidless

► Press 

DEPTH
2

 and the following is displayed:

Select source of Proctor value:
1 – Stored Value
2 – New Value

To enter a new value, go to 5.3.

To select a stored value, go to 5.4.

### 5.3 Enter a New Value

► Press 

DEPTH
2

 and the following is displayed:

Proctor:
XXXX kg/m <sup>3</sup>
Press ENTER
when completed

► Use the numbered keys to enter the required value to the nearest 1kg/m<sup>3</sup>.

- Press 

START/ ENTER =
----------------------

 and the following is displayed:
- |   |
|---|
| PR = XXXX kg/m <sup>3</sup><br>Do you want to save this<br>value for later use? |
|---|

**Note:** It is not necessary to save the displayed value to enable it.

**If the value is not to be saved:**

- Press 

NO/CE C/CE
---------------

 and the display will return to <**READY**>. Go to 6.

**To save the displayed value:**

- Press 

YES EXIT
-------------

 and the following is displayed:
- |  |
|--|
| Select Proctor<br>Memory Cell:<br>1:XX2:XX<br>3:XX4:XX |
|--|
- Press the numbered key (1, 2, 3 or 4) to select a memory cell in which to store the value.

And the following will be displayed:

Proctor XXXX kg/m <sup>3</sup> ENABLED! stored in cell X
---

The display will return to <**READY**>. Go to 6.

#### 5.4 Select a Stored Value

- Press 

COUNTS 1
-------------

 and the following is displayed:
- |  |
|--|
| Select desired<br>Proctor:<br>1:XX2:XX<br>3:XX4:XX |
|--|

- Press the numbered key (1, 2, 3 or 4) to select the required value:

And the following will be displayed:

Proctor  
XXXX kg/m<sup>3</sup>  
ENABLED!

The display will return to <READY>.

## 6 MATERIAL WET DENSITY BIAS

- Press

OFFSET  
MR

and following is displayed:

-OFFSET- Select:  
1 – Dens. –ZZZ-  
2 – Moist –ZZZ-  
3 – Trench –ZZZ-

- Press

COUNTS  
1

The following will be displayed:

Density Offset  
DISABLED  
Do you want to  
ENABLE?

OR

Density Offset  
ENABLED  
Do you want to  
DISABLE?

To disable the material wet density bias, go to 6.1.

To enable the material wet density bias, go to 6.2.

### 6.1 Disable Material Wet Density Bias

- Press

NO/CE  
C/CE

to confirm that the  
density offset is to  
remain disabled

OR

YES  
EXIT

to disable the density  
offset.

And the following will be displayed briefly:

Density Offset  
DISABLED

The display will return to <READY>. Go to 7.

## 6.2 Enable Material Wet Density Bias

► Press 

YES
EXIT

 to enable the density offset

OR 

NO/CE
C/CE

 to confirm that the density offset is to remain enabled.

The following will be displayed:

-Wet Density-  
Offset  
XXXX kg/m3  
Want to change?

To retain the value, go to 6.2.1.

To change the value, go to 6.2.2.

### 6.2.1 Retain the Value

► Press 

NO/CE
C/CE

 to retain the displayed value of Wet Density Offset.

The following will be displayed briefly:

Density Offset  
ENABLED!

The display will return to <READY>.

### 6.2.2 Change the Value

► Press 

YES
EXIT

 and the following is displayed:

- WD Offset -  
Select: + or -  
1 = +  
2 = -



► Press 

COUNT
1

 OR 

DEPTH
2

 and the following is displayed:

WD Offset
Press enter when completed

- Use the numbered keys to enter the required value to the nearest  $1\text{kg/m}^3$ .

► Press 

START/ ENTER
=

The following will be displayed:

Density Offset ENABLED!
----------------------------

The display will return to <READY>.

## 7 MATERIAL MOISTURE BIAS

► Press 

OFFSET
MR

 and the following is displayed:

-OFFSET- Select:
1 – Dens. –ZZZ-
2 – Moist –ZZZ-
3 – Trench –ZZZ-

► Press 

DEPTH
2

The following will be displayed:

Moisture Offset DISABLED Do you want to ENABLE?
--

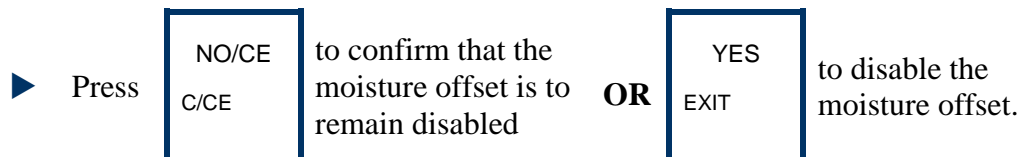
OR

Moisture Offset ENABLED Do you want to DISABLE?
--

To disable the material moisture bias, go to 7.1.

To enable the material moisture bias, go to 7.2.

## 7.1 Disable Material Moisture Bias



And the following will be displayed briefly:

Moisture Offset DISABLED
-----------------------------

The display will return to <READY>. Go to 8.

## 7.2 Enable Material Moisture Bias



And the following will be displayed:

Moisture Offset K=XX.XX Do you want to new M – Offset?
---

To retain the displayed K value, go to 7.2.1.

To change the displayed K value to a gauge-derived value, go to 7.2.2.

To change the displayed K value to a stored value, go to 7.2.3.

### 7.2.1 Retain the Value



The following will be displayed:

Moisture Offset ENABLED K = XXXX
--

The display will return to <READY>. Go to 8.

### 7.2.2 Change to a Gauge-Derived Value

To change the moisture bias to a gauge-derived value:

- Press 

YES
EXIT

 and the following is displayed: 

Select source of Offset:
1 – gauge derived
2 – stored value
- Press 

COUNTS
1

 and the following is displayed: 

SELECT
1 – True M XX%
2 – Gauge M XX%
ENTER to enable
- Press 

COUNTS
1

 and the following is displayed: 

True Moisture -
XXXX %
Press ENTER
when completed
- Use the numbered keys to enter the average oven dry moisture content to the nearest 0.01%.
- Press 

START/ ENTER
=

 and the following is displayed: 

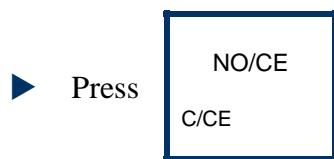
SELECT
1 – True M XX%
2 – Gauge M XX%
ENTER to enable
- Press 

START/ ENTER
=

 and the following is displayed: 

K = XXX
Do you want to save this
value for later use?

If the value is not to be saved:

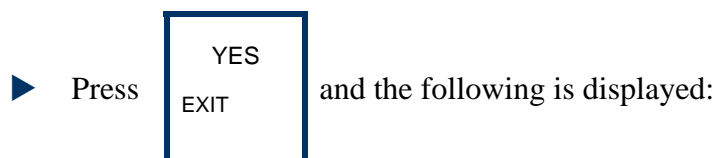


And the following will be displayed:

Moisture Offset ENABLED K = XXXX
--

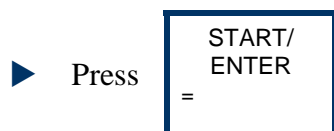
The display will return to <READY>. Go to 8.

To save the displayed value:



Enter desired memory location of M – Offset (1-4)
--

- Press a numbered key (1, 2, 3 or 4) to select a memory cell in which to store the value.



And the following will be displayed:

Moisture K SAVED K = X.XX Location 1
---

And the following will be displayed briefly:

Moisture Offset Enabled K = X.XX
--

The display will return to <READY>. Go to 8.

### 7.2.3 Change to a Stored Value

To change the moisture bias to a stored value:

- ▶ Press 

YES
EXIT

 and the following is displayed: 

Select source of Offset: 1 – gauge derived 2 – stored value
---
  
- ▶ Press 

DEPTH
2

 and the following is displayed: 

Enter desired memory location of M – Offset: (1-4)
--
  
- ▶ Press a numbered key (1, 2, 3 or 4) to select the required memory location.
  
- ▶ Press 

START/ ENTER
=

 and the following is displayed: 

Moisture Offset ENABLED K = X.XX
--

The display will return to <READY>.

## 8 TRENCH OFFSET

- ▶ Press 

OFFSET
MR

 and the following is displayed: 

-OFFSET- Select: 1 – Dens. –ZZZ- 2 – Moist –ZZZ- 3 – Trench –ZZZ-
--
  
  - ▶ Press 

CALC
3

 and the following is displayed:
- |  |
|--|
| Trench Offset<br>DISABLED<br>Want to use<br>Trench Offset? |
|--|

OR

Trench Offset ENABLED Want to use Trench Offset?
---


► Press  to disable the trench offset.

The following will be displayed briefly:



Trench Offset  
DISABLED

The display will return to <**READY**>.

► Press  if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N202

MEASUREMENT (SOILS)  
TROXLER 3440**1 SET UP**

- Press ON and allow the nuclear gauge to complete the self-test routine.

**2 MEASUREMENT**

When <**READY**> is displayed

- Press ENTER

In the manual depth mode the gauge will prompt for the source rod depth.

In the automatic depth mode the gauge software reads the depth strip on the source rod to determine the source rod depth.

At the end of the counting period, the following will be displayed:

% PR = XX%  
DD = XX kg/m<sup>3</sup>  
WD = XX kg/m<sup>3</sup>  
M = XX % M = X.X

Record the following values:

- % PR as the **percent proctor** to the nearest 0.1%.
  - DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
  - WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
  - M as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
  - % M as the **moisture content (%)** to the nearest 0.1%.
- (To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- Press SHIFT

► Press COUNTS

And the following will be displayed:

Dens Ct =   xxxxx  
Moist Ct =     xx  
          SHIFT/RECALL To  
          See Readings

Record the following values as appropriate:

- Dens Ct as the **density count**.
- Moist Ct as the **moisture count**.

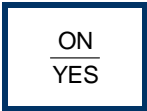
► Press NO/CE and the display will return to <**READY**>.

► Press OFF if the nuclear gauge is not required for further use.




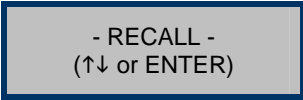

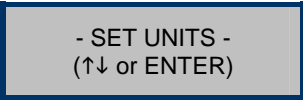

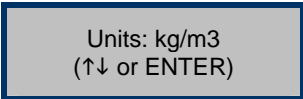


## OPERATING INSTRUCTION N203

TEST PARAMETERS (SOILS)  
TROXLER 3430**1 SET UP**


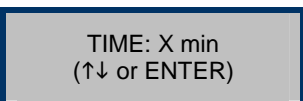

- ▶ Press  and allow the nuclear gauge to complete the self-test routine.


**2 UNITS**

When <READY> is displayed:


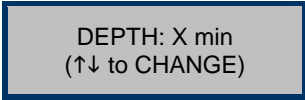


- ▶ Press  and the following is displayed: 
- ▶ Press  repeatedly until the following is displayed: 
- ▶ Press  and the following is displayed: 
- ▶ Press  to set the desired unit.
- ▶ Press  and the display will return to <READY>.

**3 COUNT TIME**


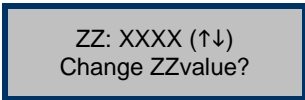


- ▶ Press  and the following is displayed: 
- ▶ Press  to set the desired count time.

- Press  and the display will return to <READY>.

#### 4 DEPTH

- Press  and the following is displayed: 
- Press  repeatedly until the required test depth is displayed.
- Press  and the display will return to <READY>.

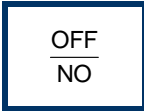
#### 5 SOIL MODE AND MAXIMUM DRY DENSITY

- Press  and the following is displayed: 
- Press  until PR is displayed. 

To retain the displayed value, go to 5.1.

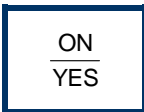
To change the displayed value, go to 5.2.

##### 5.1 Retain the Value

- Press  to retain the displayed value of PR.

The display will return to <READY>. Go to 6.


##### 5.2 Change the Value

- Press  to change the displayed value of PR.

The following is displayed:

PR XXXX  
(↑↓ or ENTER)


For each digit:

► Press  repeatedly until the required number is displayed.


► Press  to confirm each number.

The display will return to <READY>.


## 6 MATERIAL WET DENSITY BIAS

► Press  and the following is displayed:


- RECALL -  
(↑↓ or ENTER)

► Press  and the following is displayed:

- OFFSET -  
(↑↓ or ENTER)

► Press  and the following is displayed:

OFFSET: Density  
(↑↓ or ENTER)

► Press  and the following is displayed:

Dens. Offset OFF  
Want to enable?

OR

Dens. Offset ON  
Want to disable?

To disable the material wet density bias, go to 6.1.

To enable the material wet density bias, go to 6.2.

## 6.1 Disable Material Wet Density Bias

► Press 

OFF
NO

 to confirm that the density offset is to remain disabled **OR**

ON
YES

 to disable the density offset.

And the following will be displayed:

Dens. Offset OFF
------------------

The display will return to <**READY**>. Go to 7.

## 6.2 Enable Material Wet Density Bias

► Press 

ON
YES

 to enable the density offset **OR**

OFF
NO

 to confirm that the density offset is to remain enabled.

And the following will be displayed:

D off=XXX kg/m3 (↑↓ or ENTER)
----------------------------------

To retain the displayed value, go to 6.2.1.

To change the displayed value, go to 6.2.2.

### 6.2.1 Retain the Value

► Press 



START
ENTER

The following will be displayed briefly:



Dens. Offset ON
-----------------

The display will return to <**READY**>. Go to 7.

### 6.2.2 Change the Value

- Press  to enter a negative wet density bias. or  to enter a positive wet density bias.

For each digit:






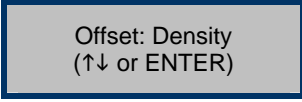

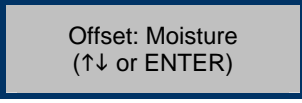

- Press  until the required number is displayed.
- Press  to confirm each number.

And following will be displayed:

Dens. Offset ON

The display will return to <READY>.

## 7 MATERIAL MOISTURE BIAS

- Press  and the following is displayed: 
- Press  and the following is displayed: 
- Press  and the following is displayed: 
- Press  and the following is displayed: 
- Press  and the following is displayed:
- Moist Offset OFF  
Want to enable?



OR

Moist. Offset ON  
Want to disable?

To disable the material moisture bias, go to 7.1.

To enable the material moisture bias, go to 7.2.

### 7.1 Disable Material Moisture Bias

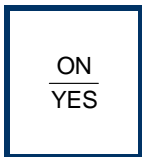
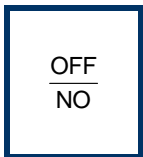
► Press  to confirm that the moisture offset is to remain disabled **OR**  to disable the moisture offset.

And the following will be displayed:

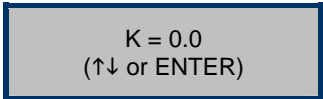


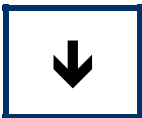

The display will return to <READY>. Go to 8.

### 7.2 Enable the Material Moisture Bias


► Press  to enable the moisture offset **OR**  to confirm that the moisture offset is to remain enabled.

And the following will be displayed:



► Press  to enter a negative K value **OR**  to enter a positive K value

For each digit:

► Press  until the required number is displayed.

► Press  to confirm each number.

And the following will be displayed:



The display will return to <READY>.

## 8 TRENCH OFFSET

- ▶ Press SPECIAL and the following is displayed: - RECALL -  
(↑↓ or ENTER)
- ▶ Press ↓ and the following is displayed: - OFFSET -  
(↑↓ or ENTER)
- ▶ Press START  
ENTER and the following is displayed: Offset: density  
(↑↓ or ENTER)
- ▶ Press ↓ repeatedly until the following is displayed: Offset: Trench  
(↑↓ or ENTER)
- ▶ Press START  
ENTER

The following will be displayed:

Trench Offset OFF  
Want to enable?
OR
Trench Offset ON  
Want to disable?

- ▶ Press ON  
YES to confirm that the trench offset is to remain disabled OR OFF  
NO to disable the trench offset.

And the following will be displayed briefly:

Trench Offset  
DISABLED

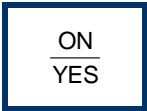
The display will return to <READY>.

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## OPERATING INSTRUCTION N204

MEASUREMENT (SOILS)  
TROXLER 3430**1 SET UP**

- ▶ Press  and allow the nuclear gauge to complete the self-test routine.


**2 MEASUREMENT**

When <READY> is displayed:

- ▶ Press  and the following is displayed:

Depth: XX mm  
Time: XX sec

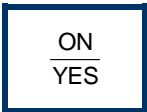
At the end of the counting period:

- ▶ Press  repeatedly until the required values are displayed.

Record the following values:

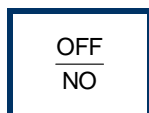
- WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
- DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
- % PR as the **relative compaction** to the nearest 0.1%.
- Moist as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
- % Moist as the **moisture content (%)** to the nearest 0.1%.
- M Count as the **moisture count**.
- D Count as the **density count**.

(To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- ▶ Press  and the display will return to <READY>.



Press



if the nuclear gauge is not required for further use.

OPERATING INSTRUCTION N205

TEST PARAMETERS (SOILS)  
TROXLER 3411B





**1. Start-up**

- ▶ Turn the PWR/TIME switch to “**NORM**”.

**2. Depth**

- ▶ Set the DEPTH switch to the required measurement depth in inches.

**3. Maximum Dry Density**

- ▶ Press   simultaneously.
- ▶ Set the +/- switch to increase or decrease the displayed value.
- ▶ Hold  or press  repeatedly until the required value is obtained to the nearest 1 kg/m<sup>3</sup>.

(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the maximum dry density by 1000.)

The display will return to normal mode after a few seconds if no key is pressed.

**4. Material Moisture Bias**

- ▶ Set the MOISTURE CORRECTION switches to the required K value to the nearest whole number (this value is not displayed).
- ▶ Turn the PWR/TIME switch to “**OFF**” if the nuclear gauge is not required for further use.

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## OPERATING INSTRUCTION N206

## MEASUREMENT (SOILS) TROXLER 3411B

### 1. Start-up

- ▶ Turn the PWR/TIME switch to “**NORM**” and allow the nuclear gauge to stabilise for at least 20 minutes before commencing the test.

### 2. Measurement

- ▶ Press 

STD
MEAS

At the end of the counting period, the following will be displayed:

XXXX
------

Record the displayed value as the **density count**.

- ▶ Press 

MC
----

 and record the displayed value as the **moisture count**.

- ▶ Press 

%MAR
WD

 and record the displayed value as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.

- ▶ Press 



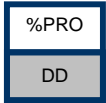
%PRO
DD

 and record the displayed value as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.

- ▶ Press 

TST
%M

 and record the displayed value as the **moisture content (%)** to the nearest 0.1%.

- Press  and record the displayed value as the **moisture content ( $\text{t/m}^3$ )** to the nearest  $0.001 \text{ t/m}^3$ .
- Press   and record the displayed value as the **compacted density** to the nearest 0.1%.

(To convert from  $\text{kg/m}^3$  to  $\text{t/m}^3$ , divide the displayed value by 1000.)



- Turn the PWR/TIME switch to “**OFF**” if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N207

## TEST PARAMETERS (SOILS) CPN MC3

### 1. Measurement Units

*Pre-March 1988 Nuclear Gauge:*

► Press   simultaneously until the density and moisture display is obtained.

► Press  until "**gcc**" is displayed.

*Post-March 1988 Nuclear Gauge:*

► Press   simultaneously.

► Press  until "**gcc**" is displayed.

► Press 

► Press  until "**Density**" is displayed.

► Press 

## 2. Count Time

► Press 

TIME
0 BS

UNIT
1 AC

TIME
0 BS

TIME
0 BS

► Press 

ENTER
-------

## 3. Maximum Dry Density

► Press 

%COMP
.

 until "Md" is displayed.

► Press 

MAX
4 A

 and use the numbered keys to enter the maximum dry density to the nearest 0.001 t/m<sup>3</sup>.

► Press 

ENTER
-------

## 4. Material Wet Density Bias

► Press 

D BIAS
5 B

► Press 

ID
-

 to enter a negative bias. Use the numbered keys to enter the material wet density bias to the nearest 0.001 t/m<sup>3</sup>.

► Press 

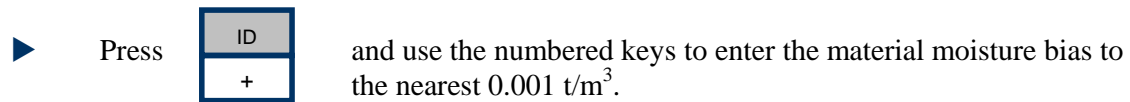
ENTER
-------



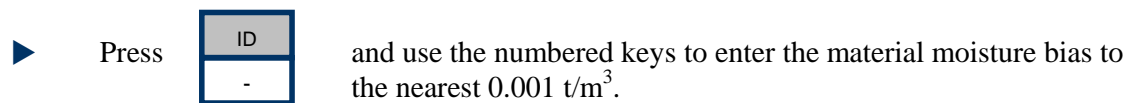
## 5. Material Moisture Bias



To enter a positive bias:



To enter a negative bias:



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## OPERATING INSTRUCTION N208

MEASUREMENT (SOILS)  
CPN MC3**1. Measurement**

At the end of the counting period, the following will be displayed:

RXXX	-XXX	XXX	XXXX
DaXX		TXX:XX	T0X:XX
gcc	wet	h2o	dry
Dn	XXXX	XXXX	XXXX
Pr	XXXX	XXXX	XXXX
%		XXXX	XXXX
Md			XXXX
Bi	XXX	XXX	

Record the following values, as appropriate:



- Dn wet as the **wet density** to the nearest  $0.001 \text{ t/m}^3$ .
- Dn dry as the **dry density** to the nearest  $0.001 \text{ t/m}^3$ .
- Dn h2o as the **moisture content ( $\text{t/m}^3$ )** to the nearest  $0.001 \text{ t/m}^3$ .
- %h2o as the **moisture content (%)** to the nearest 0.1%.
- %dry as the **relative compaction** to the nearest 0.1%.

*Pre-March 1988 Nuclear Gauge:*



Record the following values as appropriate:


- Ct wet as the **density count**.
- Ct h2o as the **moisture count**.

- Press   simultaneously to return to the density and moisture display.

*Post-March 1988 Nuclear Gauge:*

- Press   simultaneously.



- Press 

- Press  repeatedly until "**Counts**" is displayed.


- Press 

- Record the following values as appropriate:
- Ct wet as the **density count**.
  - Ct h2o as the **moisture count**.

To return to the density and moisture display:

- Press   simultaneously to return to the density and moisture display.

- Press 

▶ Press  repeatedly until "**Density**" is displayed.

▶ Press 

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OPERATING INSTRUCTION N209

TEST PARAMETERS (SOILS)  
CPN MC1DR; MC1DR-P

\* *The MC1DR has no keypad facility to set parameters*

1. Soil Mode and Maximum Dry Density

- ▶ Press

MAX

ENTER
- ▶ Press

STEP

▼

repeatedly until the following is displayed:

Proctor Test?
- ▶ Press

MAX

ENTER

1.1 Retain the Value

- ▶ Press

START

EXIT

to retain the displayed value of Max Dry Density (maximum dry density) and enable soil mode.

To enable soil mode when a maximum dry density value has not been determined, retain the displayed value of Max Dry Density.

1.2 Change the Value

- ▶ Press

STEP

▼

OR

STD

▲

repeatedly until the required maximum dry density value to the nearest 0.001 t/m<sup>3</sup> is obtained.
- ▶ Press

MAX

ENTER

to accept the value and enable soil mode.

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OPERATING INSTRUCTION N210

MEASUREMENT (SOILS)  
CPN MC1DR; MC1DR-P

1. Measurement



Press



At the end of the counting period,  
the following will be displayed:

MC-1DR

Wet Den	X.XX
Moi Den	X.XX

MC-1DR-P

TotDen	X.XX
TotWater	X.XX

Record the following values as appropriate:

- Wet Den or TotDen as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
- Moi Den or TotWater as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.



Press



The following will be displayed:

MC-1DR and  
MC-1DR-P

Dry Den	X.XX
% Water	X.X

Record the following values as appropriate:

- DryDen as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
- % Water as the **moisture content (%)** to the nearest 0.1%.



Press



The following will be displayed:

MC-1DR and  
MC-1DR-P

Dcount	XXXXX
Mcount	XXXX

Record the following values as appropriate:

- Dcount as the **density count**.
- Mcount as the **moisture count**.



The following will be displayed: MC-1DR-P only

%Proctor	XX.X
%Water	X.X

(The MC-1DR returns to the previously displayed values since it does not have a facility to calculate and display relative compaction.)

Record %Proctor as the **relative compaction** to the nearest 0.1%.

After 30 seconds, the display will turn off.



OPERATING INSTRUCTION N211

TEST PARAMETERS (SOILS)  
HUMBOLDT 5001EZ

1. Start-up

- ▶ Press **PWR** and allow the nuclear gauge to complete the initialising routine.

The following will be displayed:

\*DATA

\*SET UP

\*ENGINEERING

XX/XX/XX

XX:XX:XX

DEPTH=SAF

- ▶ Press **F2** and the following will be displayed:

\*SET UP 2

\*SET MEASUREMENT MODES

\*SET TRNCH COR.

\*SET TARGETS

2. Measurement Units

- ▶ Press **F1** and the following will be displayed:

\*SET DATE

\*SET TIME

\*UNITS = PCF/SI

- ▶ Press **F3** repeatedly until “SI” flashes.

- ▶ Press **MAIN MENU** and the display will return to the main menu.

### 3. Count Time

- Press **F2** **F2**

The following will be displayed:

MEAS = FAST/NORM/SLOW  
STD = 4MIN/16MIN  
TYPE = ASPH/SOIL/THIN  
DEPTH = AUTO/MANUAL

- Press **F1** repeatedly until “**NORM**” flashes.

### 4. Soil Mode

- Press **F3** repeatedly until “**SOIL**” flashes.

### 5. Depth

- Press **F4** repeatedly until “**AUTO**” flashes.

- Press **MAIN MENU** and the display will return to the main menu.

### 6. Maximum Dry Density

- Press **MAX “D”** and the following will be displayed:

MAXD = XXXX  
\*INCREASE  
\*DECREASE

- Press **F3** OR **F4** to increase or decrease the displayed value until the required value (within the range 900 kg/m<sup>3</sup> to 3000 kg/m<sup>3</sup>) is obtained.

(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the maximum dry density by 1000.)

- Press **MAIN MENU** and the display will return to the main menu.

## 7. Material Wet Density Bias

There is no facility to set a material wet density bias using the keypad.

## 8. Material Moisture Bias

- Press **F2** and the following will be displayed:

\*SET UP 2  
\*SET MEASURE MODES  
\*SET TRENCH COR.  
\*SET TARGETS

- Press **F4** and the following will be displayed:


MAXD= XXXX    LWD = XXXX  
KVAL = X.XXX    SPG = X.XXX  
\*INCREASE  
\*DECREASE


- Press **F2** repeatedly until the "**KVAL**" value flashes.

- Press **F3** OR **F4** to increase or decrease the displayed value until the required K value is obtained.

A maximum value of 0.20 (in increments of 0.10) and a minimum value of -0.10 (in increments of 0.01) may be set.


To disable the material moisture bias, set a value of "**0.0**".

► Press  and the display will return to the main menu.

► Press  if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N212

MEASUREMENT (SOILS)  
HUMBOLDT 5001EZ**1. Start-up**

- ▶ Press  and allow the nuclear gauge to complete the initialising routine.

**2. Measurement**

- ▶ Press  and the following will be displayed:

TAKING MEASUREMENT	
TIME REMAINING	X.XX
DC = X	
MC = X	DEPTH=XXX

At the end of the counting period, the following will be displayed:

DD = XXXX.X	%M = XX.X
WD = XXXX.X	M = XXX.X
%PR = XXX.X	MAXD = XXXX
*NEXT	MDEPTH = XXX

Record the following values as appropriate:

- DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
- WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
- %PR as the **relative compaction** to the nearest 0.1%.
- %M as the **moisture content** to the nearest 0.1%.
- M as the **moisture content** to the nearest 0.001 t/m<sup>3</sup>.



(To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- ▶ Press  and the following will be displayed:

DC = XXXX.X	DS = XXXX.X
MC = XX.X	MS = XXX.X
VR = XX.XX	%AV = X.XX
*LAST	MDEPTH= XXX

Record the following values as appropriate:

- DC as the **density count**.
- MC as the **moisture count**.

- ▶ Press  and the display will return to the main menu.
- ▶ Press  if the nuclear gauge is not required for further use.



OPERATING INSTRUCTION N213

TEST PARAMETERS (SOILS)  
HUMBOLDT 5001C

1. Start-up

- ▶

Press

ON

and allow the nuclear gauge to complete the initialising routine.
- ▶

Press

CLEAR

ENTER

SHIFT

simultaneously until the following is displayed:

SAF

0.0

2. Soil Mode

- ▶

Press

1

S/A

repeatedly until "SOIL" is displayed.
- ▶

Press

CLEAR

ENTER

3. Maximum Dry Density

- ▶

Press

LWR D

MAX D

and the following will be displayed:

dEn

XXXX.X

3.1 Retain the Value

- ▶

Press

CLEAR

ENTER

to retain the displayed value of maximum dry density.

### 3.2 Change the Value

Press  
and hold



Use the numbered keys to enter the required value  
in kg/m<sup>3</sup>.

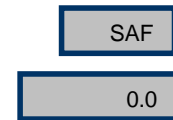
(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the maximum dry density by 1000.)



Press



repeatedly until the following is displayed:



## 4. Material Wet Density Bias

There is no facility to enter a material wet density bias using the keypad.

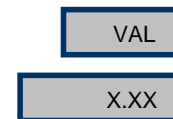
## 5. Material Moisture Bias



Press



and the following will be displayed:



### 5.1 Retain the Value



Press



to retain the displayed K value.

### 5.2 Change the Value



Press  
and hold



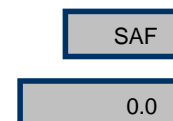
and use the numbered keys to enter the K value.



Press








repeatedly until the following is displayed:



### 5.3 Disable the Material Moisture Bias

To disable the moisture bias, enter a value of “0.0”.

► Press  repeatedly until the following is displayed:   
 


► Press  if the nuclear gauge is not required for further use.

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OPERATING INSTRUCTION N214




MEASUREMENT (SOILS)  
HUMBOLDT 5001C

1. Start-up

- Press  and allow the nuclear gauge to complete the initialising routine.

2. Measurement

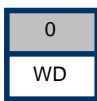
- Press   simultaneously until the following is displayed:
-   


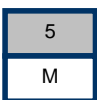
- Press  and the following will be displayed:
-   



At the end of the counting period, the following will be displayed:


  



Record the displayed value as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.


- Press  and record the displayed value as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.





- Press  and record the displayed value as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.

- Press  and record the displayed value as the **moisture content (%)** to the nearest 0.1%.

► Press  and record the displayed value as the **relative compaction** to the nearest 0.1%.

► Press  and record the displayed value as the **density count**.

► Press  and record the displayed value as the **moisture count**.

► Press   simultaneously until the following is displayed:   



(To convert from  $\text{kg/m}^3$  to  $\text{t/m}^3$ , divide the displayed value by 1000.)

► Press  if the nuclear gauge is not required for further use.



## OPERATING INSTRUCTION N215

## TEST PARAMETERS (SOILS) HUMBOLDT 5001P

### 1. Start-up

- ▶ Press  and allow the nuclear gauge to stabilise for at least 20 minutes before commencing the test.




### 2. Depth

- ▶ Press  OR  repeatedly until the required measurement depth is displayed.


### 3. Maximum Dry Density

- ▶ Press  

#### 3.1 Retain the Value

- ▶ Press    to retain the displayed value of maximum dry density.

#### 3.2 Change the Value

- ▶ Press and hold  and use the numbered keys to enter the required value to the nearest 1 kg/m<sup>3</sup>.

(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the maximum dry density by 1000.)

- ▶ Press    to store the value.

#### 4. Material Wet Density Bias

There is no facility to enter a material wet density bias using the keypad.


#### 5. Material Moisture Bias

► Press 


##### 5.1 Retain the Value

► Press   to retain the displayed K value.

##### 5.2 Change the Value

► Press and hold  and use the numbered keys to enter the K value.

► Press   to store the value.


► Press  if the nuclear gauge is not required for further use.






OPERATING INSTRUCTION N216

MEASUREMENT (SOILS)  
HUMBOLDT 5001P

**1. Start-up**

- Press  and allow the nuclear gauge to stabilise for at least ten minutes before commencing the test.





**2. Measurement**

- Press  and the following will be displayed:
-   


At the end of the counting period, the following will be displayed:


Record the displayed value as the **density count**.

- Press  and record the displayed value as the **moisture count**.
- Press  and record the displayed value as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
- Press  and record the displayed value as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
- Press  and record the displayed value as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.

- Press 

6
%M

 and record the displayed value as the **moisture content (%)** to the nearest 0.1%.

- Press 

1
%PR

 and record the displayed value as the **relative compaction** to the nearest 0.1%.

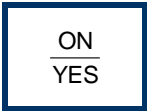
(To convert from  $\text{kg/m}^3$  to  $\text{t/m}^3$ , divide the displayed value by 1000.)

- Press 

OFF
-----


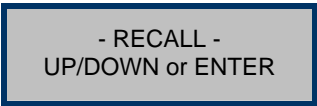



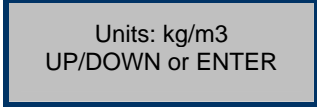

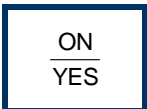
 if the nuclear gauge is not required for further use.

**OPERATING INSTRUCTION N217****TEST PARAMETERS (SOILS)  
INSTROTEK XPLOER 3500****1 SET UP**


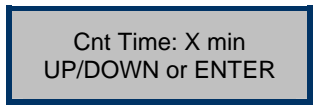


- ▶ Press  and allow the nuclear gauge to complete the self-test routine.

**2 UNITS**

When **<READY>** is displayed

- ▶ Press  and the following is displayed: 
- ▶ Press  repeatedly until the following is displayed: 
- ▶ Press  and the following is displayed: 
- ▶ Press  to set the desired unit.
- ▶ Press  and the display will return to **<READY>**.

**3 COUNT TIME**

- ▶ Press  and the following is displayed: 
- ▶ Press  to set the desired count time. 

- Press 

ON
YES

 and the display will return to <READY>.

#### 4 DEPTH

- Press 

DEPTH
-------

 the following is displayed: 

DEPTH: XX mm UP/DOWN or ENTER
----------------------------------
- Press 

DOWN
------

 repeatedly until the required test depth is displayed.
- Press 

ON
YES

 and display will return to <READY>.

#### 5 SOIL MODE AND MAXIMUM DRY DENSITY

- Press 

MA
PR

 and the following is displayed: 

ENTER selects PR DOWN selects MA
-------------------------------------
- Press 

START
ENTER

 and the following is displayed: 

PR: XXXXX Change value?
----------------------------

To retain the displayed value, go to 5.1.

To change the displayed value, go to 5.2.

##### 5.1 Retain Value

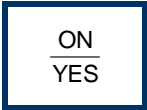
- Press 

OFF
NO


 to retain the displayed value.

The display will return to the <READY> screen. Go to 6.

## 5.2 Change the Value



- Press  to change the displayed value of PR.

The following is displayed:




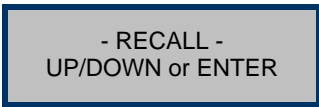





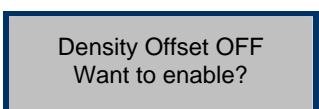
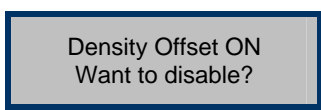
PR: XXXXX  
UP/DOWN or ENTER

For each digit:

- Press  repeatedly until the required number is displayed.
- Press  to confirm each number.

The display will return to <READY>. Go to 6.

## 6 MATERIAL WET DENSITY BIAS

- Press  and the following is displayed: 
- Press  and the following is displayed: 
- Press  and the following is displayed: 
- Press  and the following is displayed: 
- OR
- 

To disable the material wet density bias, go to 6.1.

To enable the material wet density bias, go to 6.2.

### 6.1 Disable Material Wet Density Bias

► Press 

ON
YES

 to disable the density offset.

OR

► Press 

OFF
NO

 to confirm that the density offset is to remain disabled.

The following will be displayed briefly:

Density Offset Disabled
-------------------------

The display will return to <READY>. Go to 7.

### 6.2 Enable Material Wet Density Bias

► Press 

ON
YES

 to enable the density offset.

OR

► Press 

OFF
NO

 to confirm that the density offset is to remain enabled.


And the following will be displayed:

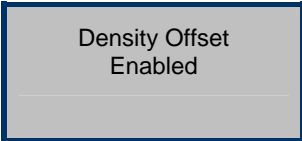
D Off = XXXX kg/m <sup>3</sup> UP/DOWN or ENTER
--

To retain the displayed value, go to 6.2.1.

To change the displayed value, go to 6.2.2.



### 6.2.1 Retain the Value

► Press  and the following will be displayed:





The display will return to <**READY**>. Go to 7.

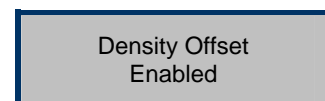
### 6.2.2 Change the Value

- Press  for a positive value.
- OR
- Press  for a negative value.

For each digit:






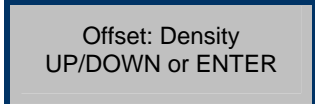
- Press  until the desired number is displayed.
- Press  to confirm each number.

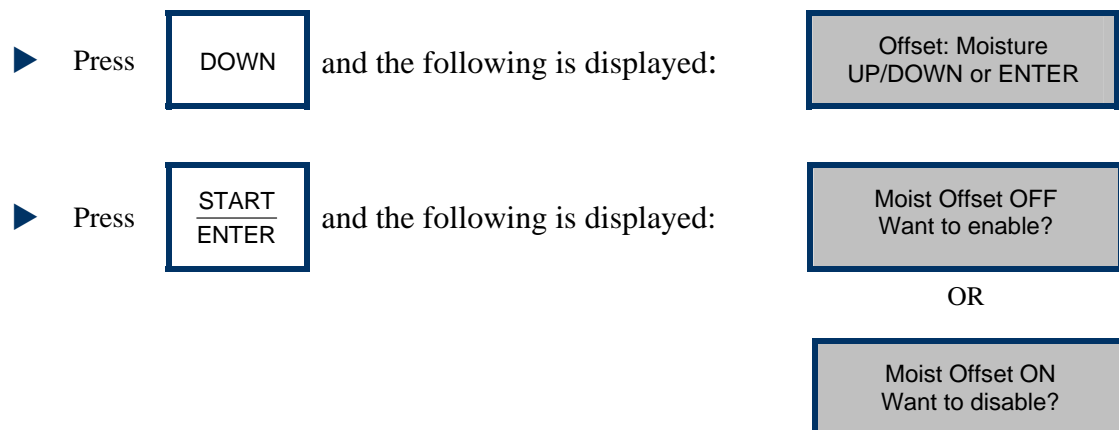
And the following will be displayed:



The display will return to <**READY**>.

## 7 MATERIAL MOISTURE BIAS

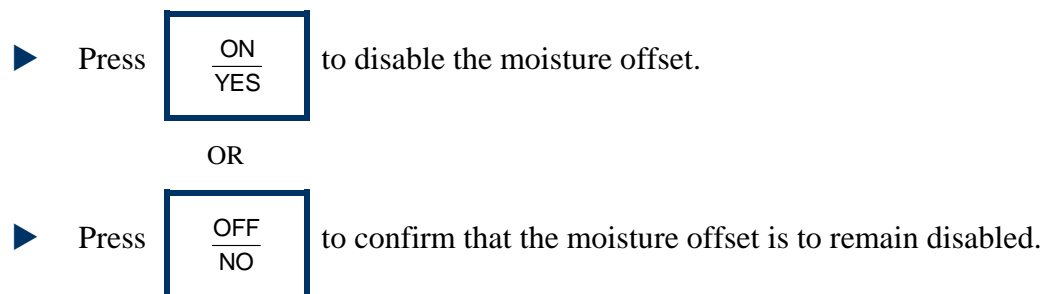
- Press  and the following is displayed:
- 
- Press  and the following is displayed:
- 
- Press  and the following is displayed:
- 



To disable the material moisture bias, go to 7.1.

To enable the material moisture bias, go to 7.2.

### 7.1 Disable the Material Moisture Bias

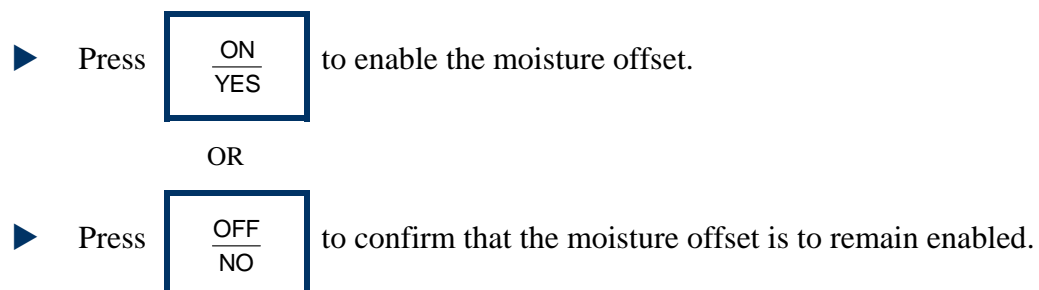


The following will be displayed:

Moisture Offset  
Disabled

The display will return to <READY>. Go to 8.

### 7.2 Enable the Material Moisture Bias





The following will be displayed:

K=XX.X  
UP/DOWN or ENTER

To retain the displayed value, go to 7.2.1.

To change the displayed value, go to 7.2.2.

### 7.2.1 Retain the Value

► Press

START  
ENTER

and the following is displayed:

Moisture Offset  
Enabled

The display will return to <READY>. Go to 8.

### 7.2.2 Change the Value

► Press

UP

for a positive value.

OR

► Press

DOWN

for a negative value.

For each digit:

► Press

DOWN

until the required number is displayed.

► Press

START  
ENTER

to confirm each number.

And the following will be displayed:

Moisture Offset  
Enabled

The display will return to <READY>.

## 8 TRENCH OFFSET

- ▶ Press MENU and the following is displayed: - RECALL -  
UP/DOWN or ENTER
  - ▶ Press DOWN and the following is displayed: - OFFSET -  
UP/DOWN or ENTER
  - ▶ Press START  
ENTER and the following is displayed: Offset: Density  
UP/DOWN or ENTER
  - ▶ Press DOWN repeatedly until the following is displayed: Offset: Trench  
UP/DOWN or ENTER
  - ▶ Press START  
ENTER and the following is displayed: Tren Offset OFF  
Want to enable?
- OR
- Tren Offset ON  
Want to disable?
- 
- ▶ Press ON  
YES to disable the trench offset.
- OR
- ▶ Press OFF  
NO to confirm that the trench offset is to remain disabled.

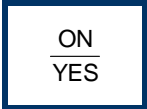
The following will be displayed:

Trench Offset  
Disabled

The display will return to **<READY>**.


## OPERATING INSTRUCTION N218

MEASUREMENT (SOILS)  
INSTROTEK XPLOER 3500**1 SET UP**

- Press  and allow the nuclear gauge to complete the self-test routine.


**2 MEASUREMENT**

When <READY> is displayed

- Press  and the following is displayed:

Time = XX sec  
Depth: XX mm

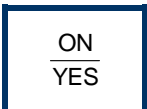
At the end of the counting period:

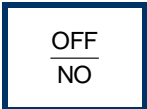
- Press  repeatedly until the required values are displayed.

Record the following values as appropriate:

- WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
- DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
- % PR as the **relative compaction** to the nearest 0.1%.
- Moist as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
- % M as the **moisture content (%)** to the nearest 0.1%.
- M Count as the **moisture count**.
- D Count as the **density count**.

(To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- Press  and the display will return to <READY>.

► Press  if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N219

TEST PARAMATERS (SOILS)  
TROXLER 3440P**1 START UP**

- ▶ Turn the power switch on and allow the nuclear gauge to complete the self-test routine.

**2 MEASUREMENT UNITS**

When **<READY>** is displayed

- ▶ Press SETUP

- ▶ Press 2

The following will be displayed:

- Units -

1. pcf
2. kg/m3
3. g/cm3

- ▶ Press 2

The following will be briefly displayed:

Metric Units  
Kg/m3  
ENABLED

The display will return to **<SETUP>**.

**3 COUNT TIME**

- ▶ Press SETUP

► Press

1

and the following is displayed:

TIME: XX  
1 - 15 sec  
2 - 1 min  
3 - 4 min

► Press

2

The following will be briefly displayed:

COUNT TIME  
1 min

The display will return to <READY>.

#### 4 SOIL MODE

► Press

MODE

The following will be displayed:

MODE: XXXX  
Select: 1 - ASPHALT  
2 - SOIL  
Press # to Select

► Press

2

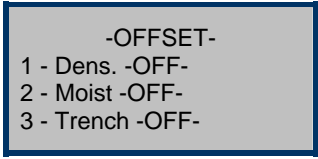
The following will be displayed briefly:

Soil Mode  
ENABLED

The display will return to <READY>.

## 5 MATERIAL WET DENSITY BIAS

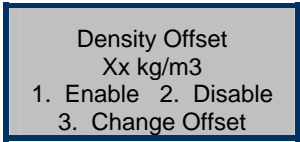
► Press  the following is displayed:



-OFFSET-  
1 - Dens. -OFF-  
2 - Moist -OFF-  
3 - Trench -OFF-

► Press 

The following will be displayed:



Density Offset  
Xx kg/m3  
1. Enable 2. Disable  
3. Change Offset

To disable the material wet density bias, go to Step 6.1.


To enable the material wet density bias, go to Step 6.2.

To change the material wet density bias, go to Step 6.3.

### 5.1 Disable Material Wet Density Bias

► Press 

The following will be displayed briefly:



Density Offset  
DISABLED

The display will return to <READY>. Go to 7.

### 5.2 Enable Material Wet Density Bias

► Press 

The following will be displayed:

Density Offset  
ENABLED

### 5.3 Change Material Wet Density Bias

- Press 3 the following is displayed:

Density Offset  
xx kg/m<sup>3</sup>  
Select (+/-)  
Input and <ENTER>

- Use the numbered keys to enter the required value to the nearest 1 kg/m<sup>3</sup>.  
(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the material wet density bias by 1000.)

- Press ENTER  
START

The following will be displayed briefly:

Density Offset  
ENABLED

The display will return to <READY>.

## 6 MATERIAL MOISTURE BIAS

- Press OFFSET the following is displayed:

-OFFSET--Select:  
1 - Dens. -OFF-  
2 - Moist. -OFF-  
3 - Trench -OFF-

- Press 2

The following will be displayed:



Moisture Offset  
1. xxxx 2. xxxx  
3. xxxx 4. xxxx  
5. New 6. Disable

### 6.1 Disable Material Moisture Bias

► Press

6

The following will be displayed:

Moisture Offset  
DISABLED

The display will return to <READY>. Go to Step 8.

### 6.2 Enable the Material Moisture Bias

► Press the number corresponding to any of the stored values.

### 6.3 Change a Material Moisture Bias Value

► Press

5

the following is displayed:

Select Offset Source  
1. Manual Entry  
2. Gauge Derived

**For manual entry:**

► Press

1

the following is displayed:

True Moisture %  
x.xx  
Press <ENTER>

Use the numbered keys to enter the average oven dry moisture content to the nearest 0.01%.

► Press

ENTER  
START

the following is displayed:

Gauge Moisture %  
0.00%  
Press <ENTER>

Use the numbered keys to enter the average standard blocks moisture content to the nearest 0.01%.

► Press ENTER  
START the following is displayed:

K = xxxx  
Do you want to save  
this value for later use ?

To save the displayed value:

► Press YES the following is displayed:

Select Memory Cell  
1.            2.  
3.            4.  
Press # to Select

► Press a numbered key (1, 2, 3 or 4) to select a memory location in which to save the value.

The following will be displayed briefly:

K   x.xx  
ENABLED

If the value is not to be displayed:

► Press NO

The display will return to <READY>.

#### For gauge derived:

► Press 2 the following is displayed:

True Moisture %  
x.xx  
Press <ENTER>

Use the numbered keys to enter the true moisture content to the nearest 0.01%.

► Press ENTER  
START the following is displayed:

Place gauge on soil,  
Lower rod and  
Press any key

Place the gauge on the measurement site and press any key.

At the completion of the counting period the following will be displayed:

K: ##.##  
Save This Value for  
Later Use ?

To save the value:

► Press

YES

To enable the value without storing:

► Press

NO

## 7 TRENCH OFFSET

► Press

OFFSET

the following is displayed:

-OFFSET-  
1 - Dens. -OFF-  
2 - Moist. -OFF-  
3 - Trench -OFF-

► Press

3

the following is displayed:

Trench Offset  
M: 0 D: 0  
1. Enable 2. Disable  
3. Change Offset

To enable the trench offset:

► Press

1

The following is displayed:

Trench Offset  
ENABLED

To disable the trench offset:

► Press

2

The following is displayed:

Trench Offset  
DISABLED

To change the trench offset:

► Press

3

The following is displayed:

Place Gauge in  
trench on Std.  
Block in SAFE Pos.  
Press <START>

► Press

ENTER  
START

At the end of the counting period the display will return to <READY>.

► Turn the power switch off if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N220

MEASUREMENT (SOILS)  
TROXLER 3440P

## 1 START UP

- ▶ Turn the power switch on and allow the nuclear gauge to complete the self-test routine.

## 2 MEASUREMENT

When <**READY**> is displayed

- ▶ Press  the following is displayed:

Depth: XX mm  
PR: XXXX kg/m<sup>3</sup>  
Time: XX sec.

In the manual depth mode the gauge will prompt for the source rod depth. In automatic mode the gauge software reads the depth strip on the source rod to determine the depth.

At the end of the counting period, the following will be displayed:

% PR = XX%  
DD = XX kg/m<sup>3</sup>  
WD = XX kg/m<sup>3</sup>  
M = XX % M = X.X

Record the following values as appropriate:

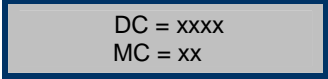
- % PR as the **relative compaction** to the nearest 0.1%.
  - DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
  - WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
  - M as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
  - % M as the **moisture content (%)** to the nearest 0.1%.
- (To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- ▶ Press 

► Press 

► Press 


The following will be displayed:



DC = xxxx  
MC = xx

Record the following values as appropriate:

- DC as the **density count**.
- MC as the **moisture count**.

► Press  and the display will return to <READY>.

► Turn the power switch off if the nuclear gauge is not required for further use.

**OPERATING INSTRUCTION N221****TEST PARAMATERS (SOILS)  
TROXLER 3430P****1 START UP**

- ▶ Turn the power switch on and allow the nuclear gauge to complete the self-test routine.

**2 MEASUREMENT UNITS**

When **<READY>** is displayed

- ▶ Press SETUP

- ▶ Press 2

The following will be displayed:

- Units -

1. pcf
2. kg/m3
3. g/cm3

- ▶ Press 2

The following will be briefly displayed:

Metric Units  
Kg/m3  
ENABLED

The display will return to **<SETUP>**.

**3 COUNT TIME**

- ▶ Press SETUP

► Press 1 and the following is displayed:

TIME: XX  
1 - 15 sec  
2 - 1 min  
3 - 4 min

► Press 2

The following will be briefly displayed:

COUNT TIME  
1 min

The display will return to <READY>.

#### 4 SOIL MODE

► Press MODE

The following will be displayed:

MODE: XXXX  
Select: 1 - ASPHALT  
2 - SOIL  
Press # to Select

► Press 2

The following will be displayed briefly:

Soil Mode  
ENABLED

The display will return to <READY>.



## 5 MATERIAL WET DENSITY BIAS

► Press OFFSET the following is displayed:

-OFFSET-  
1 - Dens. -OFF-  
2 - Moist -OFF-  
3 - Trench -OFF-

► Press 1

The following will be displayed:

Density Offset  
Xx kg/m3  
1. Enable 2. Disable  
3. Change Offset

To disable the material wet density bias, go to Step 6.1.

To enable the material wet density bias, go to Step 6.2.

To change the material wet density bias, go to Step 6.3.

### 5.1 Disable Material Wet Density Bias

► Press 2

The following will be displayed briefly:

Density Offset  
DISABLED

The display will return to <READY>. Go to 7.

### 5.2 Enable Material Wet Density Bias

► Press 1

The following will be displayed:

Density Offset  
ENABLED

### 5.3 Change Material Wet Density Bias

- Press 3 the following is displayed:

Density Offset  
xx kg/m<sup>3</sup>  
Select (+/-)  
Input and <ENTER>

- Use the numbered keys to enter the required value to the nearest 1 kg/m<sup>3</sup>.  
(To convert from t/m<sup>3</sup> to kg/m<sup>3</sup>, multiply the material wet density bias by 1000.)

- Press ENTER  
START

The following will be displayed briefly:

Density Offset  
ENABLED

The display will return to <READY>.

## 6 MATERIAL MOISTURE BIAS

- Press OFFSET the following is displayed:

-OFFSET--Select:  
1 - Dens. -OFF-  
2 - Moist. -OFF-  
3 - Trench -OFF-

- Press 2

The following will be displayed:

Moisture Offset  
1. xxxx 2. xxxx  
3. xxxx 4. xxxx  
5. New 6. Disable

### 6.1 Disable Material Moisture Bias

► Press

6

The following will be displayed:

Moisture Offset  
DISABLED

The display will return to <READY>. Go to Step 8.

### 6.2 Enable the Material Moisture Bias

► Press the number corresponding to any of the stored values.

### 6.3 Change a Material Moisture Bias Value

► Press

5

the following is displayed:

Select Offset Source  
1. Manual Entry  
2. Gauge Derived

**For manual entry:**

► Press

1

the following is displayed:

True Moisture %  
x.xx  
Press <ENTER>

Use the numbered keys to enter the average oven dry moisture content to the nearest 0.01%.

► Press

ENTER  
START

the following is displayed:

Gauge Moisture %  
0.00%  
Press <ENTER>

Use the numbered keys to enter the average standard blocks moisture content to the nearest 0.01%.

**For gauge derived:**

► Press

2

the following is displayed:

True Moisture %  
x.xx  
Press <ENTER>

Use the numbered keys to enter the true moisture content to the nearest 0.01%.

► Press

ENTER  
START

the following is displayed:

Place gauge on soil,  
Lower rod and  
Press any key

Place the gauge on the measurement site and press any key.

At the completion of the counting period the following will be displayed:

K: ##.##  
Save This Value for  
Later Use ?

To save the value:

► Press

YES

To enable the value without storing:

► Press

NO

## 7 TRENCH OFFSET

► Press

OFFSET

the following is displayed:

-OFFSET-  
1 - Dens. -OFF-  
2 - Moist. -OFF-  
3 - Trench -OFF-

► Press

3

the following is displayed:

Trench Offset



M: 0 D: 0  
1. Enable 2. Disable  
3. Change Offset

To enable the trench offset:



The following is displayed:

Trench Offset  
ENABLED

To disable the trench offset:



The following is displayed:

Trench Offset  
DISABLED

To change the trench offset:



The following is displayed:

Place Gauge in  
trench on Std.  
Block in SAFE Pos.  
Press <START>



At the end of the counting period the display will return to <READY>.

- ▶ Turn the power switch off if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N222

MEASUREMENT (SOILS)  
TROXLER 3430P

## 1 START UP

- ▶ Turn the power switch on and allow the nuclear gauge to complete the self-test routine.

## 2 MEASUREMENT

When <READY> is displayed

- ▶ Press  the following is displayed:

Depth: XX mm  
PR: XXXX kg/m<sup>3</sup>  
Time: XX sec.

In the manual depth mode the gauge will prompt for the source rod depth. In automatic mode the gauge software reads the depth strip on the source rod to determine the depth.

At the end of the counting period, the following will be displayed:

% PR = XX%  
DD = XX kg/m<sup>3</sup>  
WD = XX kg/m<sup>3</sup>  
M = XX % M = X.X

Record the following values as appropriate:

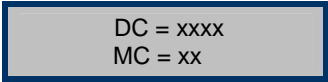
- % PR as the **relative compaction** to the nearest 0.1%.
  - DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
  - WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
  - M as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
  - % M as the **moisture content (%)** to the nearest 0.1%.
- (To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- ▶ Press 

► Press 

► Press 


The following will be displayed:



DC = xxxx  
MC = xx

Record the following values as appropriate:

- DC as the **density count**.
- MC as the **moisture count**.

► Press  and the display will return to <READY>.

► Turn the power switch off if the nuclear gauge is not required for further use.



## OPERATING INSTRUCTION N223

TEST PARAMETERS (SOILS)  
TROXLER 3450**1 SET UP**

- Press **ON** and allow the nuclear gauge to complete the self-test routine.

**2 UNITS**

When **<READY>** is displayed:

- Press

**SPECIAL**

- Press

**4**

To access the Gauge Setup menu.

1-	Set Time/Date	↑
2-	Print Set-Up	
3-	Depth Indicator	
4-	Set Beeper Level	↓

Scroll through the menu using the arrow keys.

- Press

**8**

and the following is displayed:

UNITS in XXX
1 – PCF
2 – kg/m <sup>3</sup>
3 – g/cm <sup>3</sup>

- Press

**2**

and the following is displayed:

UNITS IN kg/m <sup>3</sup>
----------------------------

The display will return to the Gauge Setup menu.

### 3 COUNT TIME

► Press TIME and the following is displayed:

COUNT TIME: XX  
1 – 15 sec  
2 – 1 min  
3 – 4 min

► Press 2 and the following is displayed:

-COUNT TIME-  
60 sec

The display will return to <READY>.

### 4 SOIL MODE

► Press MODE and the following is displayed:

- MODE -  
1 – Soil Mode  
2 – Asphalt Mode  
3 – Thin Layer Mode

► Press 1

And the following will be displayed briefly:

Soil Mode Enabled

The display will return to <READY>.

### 5 MATERIAL WET DENSITY BIAS

► Press OFFSET and the following is displayed:

OFFSET Select  
1 – Wet Density OFF  
2 – Moisture OFF  
3 – Trench OFF



The following will be displayed:

Wet Density Offset:  
xxxx kg/m<sup>3</sup>  
1 – Enable    2 – Disable  
3 – Change Offset

To disable the material wet density bias:



Wet Density Offset  
DISABLED

To enable the material wet density bias:



Wet Density Offset  
ENABLED

### 5.1.1 Change the Value



Wet Density Offset  
xxxx kg/m<sup>3</sup>  
Select (+/-)



- ▶ Use the numbered keys to enter the required value to the nearest  $1\text{kg/m}^3$ .

- ▶ Press

ENTER

The following will be displayed:

Density Offset

ENABLED

The display will return to <READY>.

## 6 MATERIAL MOISTURE BIAS

- ▶ Press

OFFSET

and following is displayed:

OFFSET Select:  
1 – Wet Density    OFF  
2 – Moisture       OFF  
3 – Trench         OFF

- ▶ Press

2

The following will be displayed:

Moisture Offset:

K = 0.00

1 – Enable    2 – Disable

3 – Change Offset

To disable the moisture offset:

- ▶ Press

2

and following is displayed:

Moisture Offset  
DISABLED

To enable the moisture offset:

- Press 1 and following is displayed:

Moisture Offset  
ENABLED

### 6.1.1 Change the Value

- Press 3 and the following is displayed:

Moisture Offset  
1 – Stored Offset  
2 – Gauge Derived  
3 – Keypad Entry

To select a stored offset:

- Press 1 and the following is displayed:

Moisture Offset  
Select K Value Cell:  
1 – 0.00    2 – 0.00  
3 – 0.00    4 – 0.00

- Use the numbered keys to enter the required value to the nearest 0.01%.

The display will return to <READY>.

### 6.1.2 Change to a Gauge-Derived Value

To change the moisture bias to a gauge-derived value:

- Press 3 and the following is displayed:

Moisture Offset  
1 – Stored Offset  
2 – Gauge Derived  
3 – Keypad Entry

- Press 2 and the following is displayed:

Gauge Derived  
Moisture Offset  
1 – Measure Moisture  
2 – Input True Moist

- Press 1 and the following is displayed:

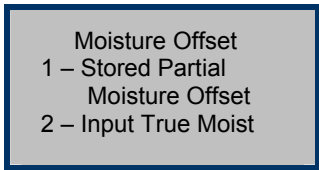
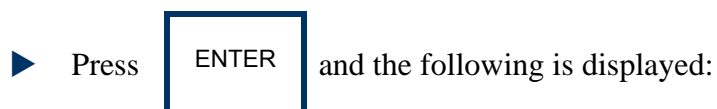
Place Gauge On  
Surface To Be Tested  
Press START For 4  
One – Minute Counts



The gauge displays the progress of the measurements. After each reading the gauge displays the results. To continue to the next measurement:



After the last measurement:



Moisture Offset  
1 – Stored Partial  
Moisture Offset  
2 – Input True Moist

To enter the true moisture later:



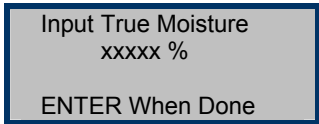
To overwrite the partial offset:



To use the stored partial offset:



To enter the true moisture now:



Input True Moisture  
xxxxx %  
ENTER When Done

## 7 TRENCH OFFSET

► Press **OFFSET** and following is displayed:

OFFSET Select:  
1 – Wet Density    OFF  
2 – Moisture       OFF  
3 – Trench         OFF

► Press **3** and following is displayed:

Trench: TMO = xxxx  
TDO = xxxx    xxxx  
1 – Enable    2 - Disable  
3 – Change Offset

To disable the trench offset:

► Press **2** and following is displayed:

Trench Offset  
DISABLED

To enable the trench offset:

► Press **1** and following is displayed:

Trench Offset  
ENABLED

To create a new trench offset:

► Press **3** and following is displayed:

Set Rod To STD Pos  
Press START For  
1 Minute STD Count  
In Trench

Position the gauge inside the trench and:

► Press **START**

The gauge will display the progress of the standard count operation.

After the standard count the gauge displays:

New Trench Offset  
TMO = xxxx  
TDO = xxxx    xxxx  
Want To Accept ?

To enable the new trench offset:

► Press 

YES

To create another trench offset:

► Press 

NO



## OPERATING INSTRUCTION N224

MEASUREMENT (SOILS)  
TROXLER 3450**1 SET UP**

- Press  and allow the nuclear gauge to complete the self-test routine.

**2 MEASUREMENT**

When <READY> is displayed

- Press 

In the manual depth mode the gauge will prompt for the source rod depth.

In the automatic depth mode the gauge software reads the depth strip on the source rod to determine the source rod depth.

At the end of the counting period, the following will be displayed:

% PR = XX%  
DD = XX kg/m<sup>3</sup>  
WD = XX kg/m<sup>3</sup>  
M = XX % M = X.X

Record the following values:

- % PR as the **percent proctor** to the nearest 0.1%.
  - DD as the **dry density** to the nearest 0.001 t/m<sup>3</sup>.
  - WD as the **wet density** to the nearest 0.001 t/m<sup>3</sup>.
  - M as the **moisture content (t/m<sup>3</sup>)** to the nearest 0.001 t/m<sup>3</sup>.
  - % M as the **moisture content (%)** to the nearest 0.1%.
- (To convert from kg/m<sup>3</sup> to t/m<sup>3</sup>, divide the displayed value by 1000.)

- Press 

And the following will be displayed:

- Counts -

DC:   xxxxx   xxxx

MC:       xx

Press ESC To Exit

Record the following values as appropriate:

- If the reading is taken at a 100mm – 300mm depth, DC for system 1 (upper left reading) + DC for system 2 (upper right reading) as the **density count**.
- If the reading is taken at 50mm or 75mm, DC for system 2 (upper right reading) as the **density count**.
- MC as the **moisture count**.

▶ Press ESC and the display will return to <**READY**>.

▶ Press OFF if the nuclear gauge is not required for further use.

## OPERATING INSTRUCTION N225

TEST PARAMETERS (SOILS)  
CPN MC1 AND MC3 ELITE**1 SET UP**

- Press ON  
YES and allow the nuclear gauge to complete the self-test routine.

**2 UNITS**

- Press MENU the first screen will be:
1. Recall  
 2. Set depth  
 UP/DOWN for next  
 Select #, ESC exit
- 
- Press DOWN the following is displayed:
11. Auto scroll  
 12. Set units  
 UP/DOWN for next  
 Select #, ESC exit
- 
- Press 12 (button **1** then **2**)
1. PCF  
 2. kg/m3  
 3. GCC  
 Select #, ESC exit
- 
- After selecting the unit of measurement the gauge returns to the menu screen
11. Auto scroll  
 12. Set units  
 UP/DOWN for next  
 Select #, ESC exit
- 
- Press ESC returns to ready screen
- GAUGE READY  
 COUNT TIME: # min  
 Depth: ###    Offset: N  
 <date>        <time>

### 3 COUNT TIME

- Press

TIME

and the following is displayed:

Cnt Time: ## min.  
UP/DOWN TO CHANGE  
YES to Accept  
ESC to Exit

- Press UP and DOWN to set the desired count time.

- Press

YES

returns to ready screen

GAUGE READY  
COUNT TIME: # min  
Depth: ### Offset: N  
<date> <time>

### 4 DEPTH

The Elite gauge is equipped with an automatic non-magnetic depth indicator. The depth is automatically read as you lower the source into the measure position and the appropriate constants are selected to calculate the density.

The gauge can be placed into manual depth mode by disabling the Automatic depth mode from the MENU functions.

### 5 SOIL MODE AND MAXIMUM DRY DENSITY

- Press

$\frac{MA}{PR}$

and the following is displayed:

1. Proctor  
2. Max. Dens  
Select #, ESC exit

- Press

1

For Proctor.

PR: ##### PCF  
Change value?  
Press YES or NO  
ESC to Exit



Enter value for  
Proctor: ### PCF  
ENTER to accept  
ESC to Exit

Use the number buttons to change the value. Once you have entered the PR value the gauge will return to ready screen.

## 6 OFFSET

There are three offset options for the gauge: Density, Moisture and Trench

To use the offset mode:



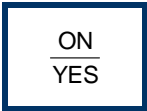
▶ Scroll **UP** or **DOWN** to select the offset you want to enable

▶ For entering a negative number use the **DOWN** button, for a positive number use the **UP** button

Note: When an offset is enabled a **Y** on the gauge ready screen will appear next to offset.


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**OPERATING INSTRUCTION N226****MEASUREMENT (SOILS)  
CPN MC1 AND MC3 ELITE****1 SET UP**

- Press  and allow the nuclear gauge to complete the self-test routine.

**2 MEASUREMENT**

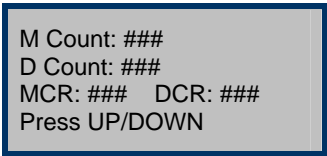
When the ready screen is displayed:


- Press  and the following is displayed:

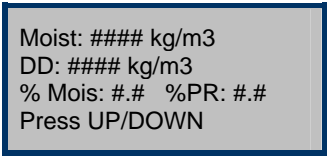
Depth: XX mm

Time: XX sec

At the end of the counting period the gauge will display:

►   
M Count: ###  
D Count: ###  
MCR: ### DCR: ###  
Press UP/DOWN

►   
WD: #### kg/m3  
%MA: ####  
%VOIDS: ####  
Press UP/DOWN

►   
Moist: #### kg/m3  
DD: #### kg/m3  
% Mois: .# %PR: .#  
Press UP/DOWN

Record the following values:

- WD as the **wet density** to the nearest  $0.001 \text{ t/m}^3$ .
- DD as the **dry density** to the nearest  $0.001 \text{ t/m}^3$ .
- % PR as the **relative compaction** to the nearest 0.1%.
- Moist as the **moisture content ( $\text{t/m}^3$ )** to the nearest  $0.001 \text{ t/m}^3$ .
- % Moist as the **moisture content (%)** to the nearest 0.1%.
- M Count as the **moisture count**.
- D Count as the **density count**.

(To convert from  $\text{kg/m}^3$  to  $\text{t/m}^3$ , divide the displayed value by 1000.)

► Press 

ON
YES

 and the display will return to the ready screen

► Press 

OFF
NO

 if the nuclear gauge is not required for further use.